

Late-onset hypogonadism

Estimated incidence 15-20% patients > 70 years old

Definition

Low serum testosterone in association with symptom complex

Low serum testosterone

Normal	> 12 nmol/l	(> 400 ng/dl)
Equivocal	8-12 nmol/l	(200 – 400 ng/dl)
Low	< 8 nmol/l	(< 200 ng/dl)

Symptom complex:

- Sexual dysfunction (ED, reduced libido)
- Lethargy
- Depression
- Osteoporosis
- Reduced cognition
- Reduced body hair
- Small testes
- Reduced sperm counts
- Hot flushes and sweats

Testicular failure - conditions

Pituitary

- Kallman's
- Pituitary tumour
- Pituitary ablation
- Haemochromatosis

Testicular

- Mumps
- Radiotherapy
- Chemotherapy
- Trauma

Other

- Severe systemic disease
- Hormonal abnormality (high cortisol)
- Aging

Diagnostic considerations

See EAU guidelines

Normally

- 3% free (bioavailable)
- 97% protein bound
 - 60% Sex hormone binding globulin (SHBG)
 - 37% Albumin

Free T cannot be measured easily. Therefore **ratio of total T to SHBG-bound T gives an estimation of bioavailable T**. However becomes inaccurate with high SHBG, usually seen with aging, obesity and hyperthyroidism. In these situations single best test is Free-T, as determined by equilibrium dialysis, but expensive and cumbersome

Testosterone replacement therapy

May improve muscle mass, reduce fat mass, improve sexual function and improve cognition. However evidence is very limited. No effect on lipid profile. No evidence that T therapy causes Pca or BPH, or that it will convert subclinical to clinical prostate cancer. However should be avoided in men receiving treatment for metastatic prostate cancer or breast cancer. Must investigate and elevation in PSA or abnormal DRE first.

Modalities

Oral T absorbed by gut but metabolised by liver in first pass – not effective
Formulation in oleic acid (undecanoate) bypasses liver and into systemic circulation via lymphatics – bd or tds dosing. Good levels and can be stopped quickly, expensive
Injectable esters (propionate)
cheap, painful, high peaks and troughs due to maximum weekly administration – therefore high peaks desire etc.
T poor transdermal patch: daily administration, reasonable compliance, stopped quickly but expensive and skin irritation
Androderm (5mg normal dose) – skin irritation in 50%: Testoderm (5mg) smaller and less skin irritation but falls off.
Transdermal gel: 10% absorbed (50mg). Good compliance but watch for transfer from to partner and kids and most expensive
Buccal – available but poor compliance
Nasal spray – in development

Side effects

Long-term Rx a/w:
Erythrocytosis
Infertility
Breast tenderness
Oral T preparations a/w liver abnormalities (first pass effect), including hepatocellular carcinoma

Contraindications

Prostate cancer
Breast cancer
Pre-existing polycythaemia
Cardiac, liver or renal failure
Obstructive sleep apnoea (relative CI)